Application No. 09/890,441   Customer No. 01933
Response to Office Action

Listing of Claims:

1.   (Currently Amended) A wander generator comprising:

random number generating means for sequentially generating ~~a~~

random number ~~signal comprised of~~ signals comprising a plurality

of bits at a constant rate in accordance with a predetermined

5   algorithm;

a filter unit ~~for receiving~~ which receives a sequence of the

random number signals output from said random number generating

means ~~for performing~~ to perform filtering;

clock generating means for generating a clock signal;

10   modulating means for modulating ~~the~~ a frequency of the clock

signal generated by said clock ~~signal generator~~ generating

means by a signal output from said filter unit; and

setting means for setting each amplitude value for a

spectrum of a signal sequence output from said filter unit such

15   that ~~the~~ a characteristic of wander of the clock signal having

the frequency modulated by said modulating means matches a

desired characteristic.

2.   (Currently Amended) A wander generator according to

claim 1, ~~characterized in that~~ wherein said random number ~~signal~~

generating means ~~has~~ comprises a plurality of pseudo random

signal ~~generator, wherein said plurality of pseudo random signal~~

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5   generators which combine pseudo random signals generated thereby

respectively, and said random number generating means is

configured to sequentially generate random number signals

~~comprised of~~ comprising the plurality of bits at a constant

speed.

3.   (Currently Amended) A wander generator according to

claim 1, ~~characterized in that~~ wherein said filter unit ~~includes~~

comprises:

a plurality of storage elements for storing an input signal

5   sequence while sequentially shifting ~~it~~ the input signal

sequence; and

calculating means for performing a product sum calculation

of stored values stored in said plurality of storage elements

with a plurality of coefficients.

4.   (Currently Amended) A wander generator according to

claim 3, ~~characterized in that~~ wherein said filter unit is

configured to store ~~a~~ the random number signal sequence output

from said random number generating means in said plurality of

5   storage elements, to perform the product sum calculation ~~by means~~

~~of~~ with said calculating means, and to filter the random number

signal sequence, and

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wherein said setting means sets the plurality of

coefficients in said calculating means as signals for setting

10   respective amplitude values for spectra of the signal sequence

output from said filter unit.

5.   (Currently Amended) A wander generator according to

claim 3, ~~characterized in that~~ wherein said filter unit

comprises:

data distributing means for distributing the random number

5   signal sequence generated by said random number ~~signal~~ generating

means into a plurality of paths having different rates from each

other;

weighting means for weighting a signal sequence for each of

the paths distributed by said data distributing means with a

10   previously set coefficient for each of the paths; and

combining means for combining the signal sequences on the

respective paths weighted by said weighting means ~~by means of~~ via

a plurality of sub-band combiners ~~comprised of~~ comprising a

plurality of storage elements and the calculating means and for

15   outputting ~~the~~ a result of the combination as ~~the~~ a result of

filtering, and

wherein said setting means sets the plurality of weighting

coefficients in said weighting means of said filter unit as

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signals for setting respective amplitude values for spectra of

20   the signal sequence output from said filter unit.

        6.   (Currently Amended) A wander generator according to

claim 3, ~~characterized by~~ further comprising initial setting

means for initially setting values equivalent to stored values

stored in said respective storage elements in a steady state in

5   which the clock signal having the wander of the desired

characteristic is being output to said respective storage

elements included in the filter unit at least in an initial phase

of operation of said apparatus through a path different from a

signal input path in the steady state.

        7.   (Currently Amended) A wander generator according to

claim 1, ~~characterized by~~ further comprising:

        characteristic calculating means for calculating ~~a~~

the characteristic of wander in ~~a~~ the clock signal

5   frequency-modulated by said modulating means based on information

including a signal set in said filter unit from said setting ~~unit~~

means; and

        characteristic display means for displaying the

characteristic calculated by said characteristic calculating

10   means.

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Claim 8 (Canceled).

9.   (Currently Amended) A wander generator for generating a
clock signal having wander which satisfies a desired time
deviation characteristic, ~~characterized by~~ comprising:

center frequency information setting means for setting data

5   for determining a center frequency of the clock signal;

characteristic information setting means for setting
characteristic information of the desired time deviation
characteristic;

a fluctuating signal sequence generator unit for generating

10   a fluctuating signal sequence having a power spectrum density
distribution characteristic of frequency fluctuations
corresponding to the desired time deviation characteristic based
on the characteristic information set by said characteristic
information setting means;

15   an adder for adding the data set by said center frequency
information setting means to the fluctuating signal sequence
output from said fluctuating signal sequence generator unit;

a direct digital synthesizer for outputting a frequency
signal corresponding to an output of said adder; and

20   a clock signal output circuit for waveform shaping an output
signal of said direct digital synthesizer to output a clock
signal;

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wherein said fluctuating signal sequence generator unit

comprises:

25   noise generating means for generating a white noise signal

based on a pseudo random signal;

        impulse response processing means for calculating an impulse

response of a transfer function for approximating a power

spectrum of the white noise signal output from said noise

30   generating means to the power spectrum density distribution

characteristic of the frequency fluctuations based on the

characteristic information set by said characteristic information

setting means; and

        convolution processing means for convoluting a result of the

35   calculation by said impulse response processing means with the

missourians white noise signal output from the noise generating

means to generate the fluctuating signal sequence having the

power spectrum density distribution characteristic of the

frequency fluctuations.

        Claim 10 (Canceled)

        11.   (Currently Amended) A wander generator according to the

claim ~~10~~ 9, ~~characterized in that~~ wherein said impulse response

processing means corrects ~~an~~ the impulse response with a

correction function corresponding to an error between the power

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spectrum density distribution characteristic of the frequency

fluctuations and the transfer function.

12.   (Currently Amended) A wander generator according to

claim ~~10~~ 9, ~~characterized in that~~ wherein said convolution

processing means preferentially performs ~~the~~ a product sum

calculation for smaller absolute values of the result of the

calculation for the impulse response.

13.   (Currently Amended) A wander generator according to

claim ~~10~~ 9, ~~characterized in that~~ wherein said impulse response

processing means is configured to perform the calculation for the

impulse response each time a white noise signal is output from

5   the noise generating means; and

       wherein said convolution processing means performs the

convolution processing using the result of the calculation made

each time by the impulse response processing means.

14.   (Currently Amended) A wander generator ~~according to~~

~~claim 9,~~ for generating a clock signal having wander which

satisfies a desired time deviation characteristic, comprising:

       center frequency information setting means for setting data

5   for determining a center frequency of the clock signal;

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characteristic information setting means for setting

characteristic information of the desired time deviation

characteristic;

    a fluctuating signal sequence generator unit for generating

10   a fluctuating signal sequence having a power spectrum density

distribution characteristic of frequency fluctuations

corresponding to the desired time deviation characteristic based

on the characteristic information set by said characteristic

information setting means;

15   an adder for adding the data set by said center frequency

information setting means to the fluctuating signal sequence

output from said fluctuating signal sequence generator unit;

    a direct digital synthesizer for outputting a frequency

signal corresponding to an output of said adder; and

20   a clock signal output circuit for waveform shaping an output

signal of said direct digital synthesizer to output a clock

signal;

    characterized in that wherein said fluctuating signal

sequence generator unit comprises:

25   noise generating means for generating a white noise signal

based on a pseudo random signal;

    data distributing means for distributing noise signals

output from said noise generating means into respective signal

paths respectively in accordance with a plurality of bands into

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30   which a frequency range of a~~ the power spectrum density

     distribution characteristic of the frequency fluctuations is

     divided to output at rates corresponding to the respective bands;

          weighting means for applying weights in accordance with ~~the~~

     a magnitude of spectrum of each of the bands into which the

35   frequency band of the power spectrum density distribution

     characteristic is divided for the noise signals at the respective

     rates distributed by said data distributing means; and

          combining means for combining the noise signals at the

     respective rates weighted by said weighting means to generate a~~

40   the fluctuating signal sequence having the power spectrum density

     distribution characteristic of the frequency fluctuations.

     15.   (Currently Amended) A wander generator according to

     claim ~~10~~ 9, ~~characterized in that~~ wherein said noise generating

     means ~~has~~ comprises a plurality (m) of sets of pseudo random

     signal generating means for generating pseudo random codes of M

5   sequence at initial phases different from one another, and is

     configured to collect outputs at predetermined stages of said

     respective pseudo random signal generating means to output an

     m-bit parallel white noise signal.

          Claims 16-21 (Canceled).

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22.   (Currently Amended) A wander generator according to
claim 5, ~~characterized by~~ further comprising initial setting
means for initially setting values equivalent to stored values
stored in said respective storage elements in a steady state in
5   which the clock signal having the wander of the desired
characteristic is being output to said respective storage
elements included in the filter unit at least in an initial phase
of operation of said apparatus through a path different from a
signal input path in the steady state.

23. (Currently Amended) A wander generator according to
claim 14, ~~characterized in that~~ wherein said noise generating
means ~~has~~ comprises a plurality (m) of sets of pseudo random
signal generating means for generating pseudo random codes of M
5   sequence at initial phases different from one another, and is
configured to collect outputs at predetermined stages of said
respective pseudo random ` means to output an m-bit parallel
white noise signal.

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